Role of the fungal toxins cerulenin and helvolic acid in the rice - *Sarocladium oryzae* interaction

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Sheath rot is a very aggressive, emerging disease of rice causing significant yield losses every year. During the last decades, sheath rot has spread worldwide to all rice-producing areas. The most important causal agent of sheath rot is the poorly studied fungal pathogen *Sarocladium oryzae. S. oryzae* produces at least two toxins, helvolic acid and cerulenin. Up to now, these toxins were believed to be the main pathogenicity factors since they are both phytotoxic. Besides that, helvolic acid has antibacterial activity, while cerulenin inhibits melanin and polyketide biosynthesis in other fungi. As a clear correlation with disease severity is still missing, this research aims to thoroughly study the role of cerulenin and helvolic acid in rice - *S. oryzae* interaction. Rice plants were infiltrated with crude extract from a liquid culture of *S. oryzae* containing different concentrations of toxins. According to literature, exogenous application of both toxins can mimic sheath rot symptoms but these observations could not be confirmed. Using the standard grain inoculum technique, rice plants were inoculated with *S. oryzae* isolates with different levels of virulence. The toxin production of the different isolates was measured *in vitro* and *in planta* using HPLC-ESI-MS/HRMS and was correlated with disease severity. Cerulenin or helvolic acid levels were not linearly correlated with pathogenicity. It was observed, however, that the toxin levels of the most aggressive isolates were all within a certain concentration range. Based on these data, we can conclude that both toxins are produced *in planta* and interact with the rice plant, but they are not the main pathogenicity factors of *S. oryzae*. Ongoing research with non-toxin producers will further elucidate the role of helvolic acid and cerulenin in the interaction of *S. oryzae* with the rice plant.